

CLAIMS

What is claimed is:

1. A method of processing red eye in digital images, comprising:

detecting a skin color area in an image;

5 picking up all boundaries within the detected skin color area;

detecting one boundary within the skin color area that matches with an eyelid
quadratic curve to determine an eyelid area; and

detecting red color pixels in the eyelid area, filling the detected red color pixels.
2. The processing method of claim 1, wherein detecting a skin color area in the
10 image further comprises:

converting the image into an HIS format;

marking pixels with HIS values within the skin color area as skin color pixels; and

marking the continuous area composed by the skin color pixels as a skin color area.
3. The processing method of claim 1, picking up all boundaries within the detected
15 skin color area further comprises:

converting the skin color area into a gray scale image;

calculating a gradient of the gray scale image;

comparing the gradient values between two adjacent rows of pixels; and

marking as being part of a boundary the pixels for which the gradient value is greater
20 than a gradient threshold reference.

4. The processing method of claim 1, wherein picking up all boundaries within the detected skin color is performed by marking detected edges as boundaries.

5. The processing method of claim 1, wherein picking up all boundaries within the detected skin color further comprises:

5 detecting a visage area within the skin color area; and
picking up all boundaries within the visage area.

6. The processing method of claim 5, wherein detecting a visage area within the skin color area further comprises:

calculating a number of pixels and a number of pixel rows inside the skin color area;
10 and

marking as a visage area a closed area of the skin color area that has the number of pixels and the number of pixel rows respectively greater than a pixel number reference and a pixel row number reference.

7. The processing method of claim 1, wherein determining the eyelid area further
15 comprises:

according to a expression of the eyelid quadratic curve, determining upper and lower eyelid quadratic curves;

calculating a horizontal coordinate error between respective apexes of the upper and lower eyelid curves; and

20 if the horizontal coordinate error is smaller than an apex reference value, an area enclosed by the upper and lower eyelid quadratic curve is an eyelid area.

8. The processing method of claim 1, wherein a expression of the eyelid quadratic curve is:

$$Y = aX^2 + bX + c,$$

wherein if $0.01 < -a < 0.05$ the eyelid quadratic curve is an upper eyelid quadratic curve, and if $0.01 < a < 0.05$ the eyelid quadratic curve is a lower eyelid quadratic curve.

9. The processing method of claim 1, further including detecting inner boundaries of
5 the eyelid area that match with an iris quadratic curve to determine an iris area.

10. The processing method of claim 9, wherein a expression of the iris quadratic curve is:

$$X = aY^2 + bY + c,$$

wherein if $a > 0$ the iris quadratic curve is a left iris quadratic curve, and if $a < 0$ the
10 iris quadratic curve is a right iris quadratic curve.